No. 677,409. Patented July 2, 1901.

W. D. GHARKY.

TELEPHONE RECEIVER.

(Application filed Sept. 4, 1900.)

(No Model.)

Fig. 1.

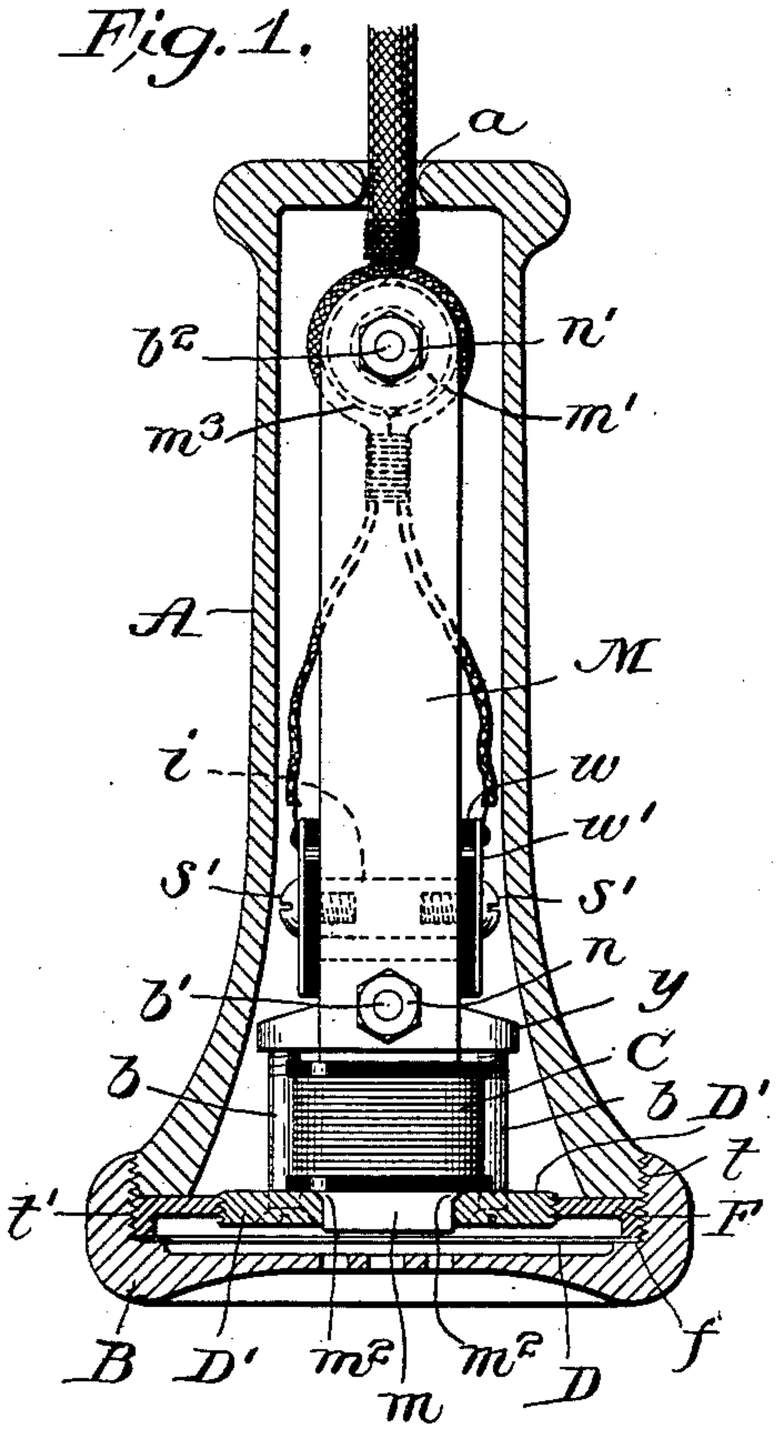


Fig. 2.

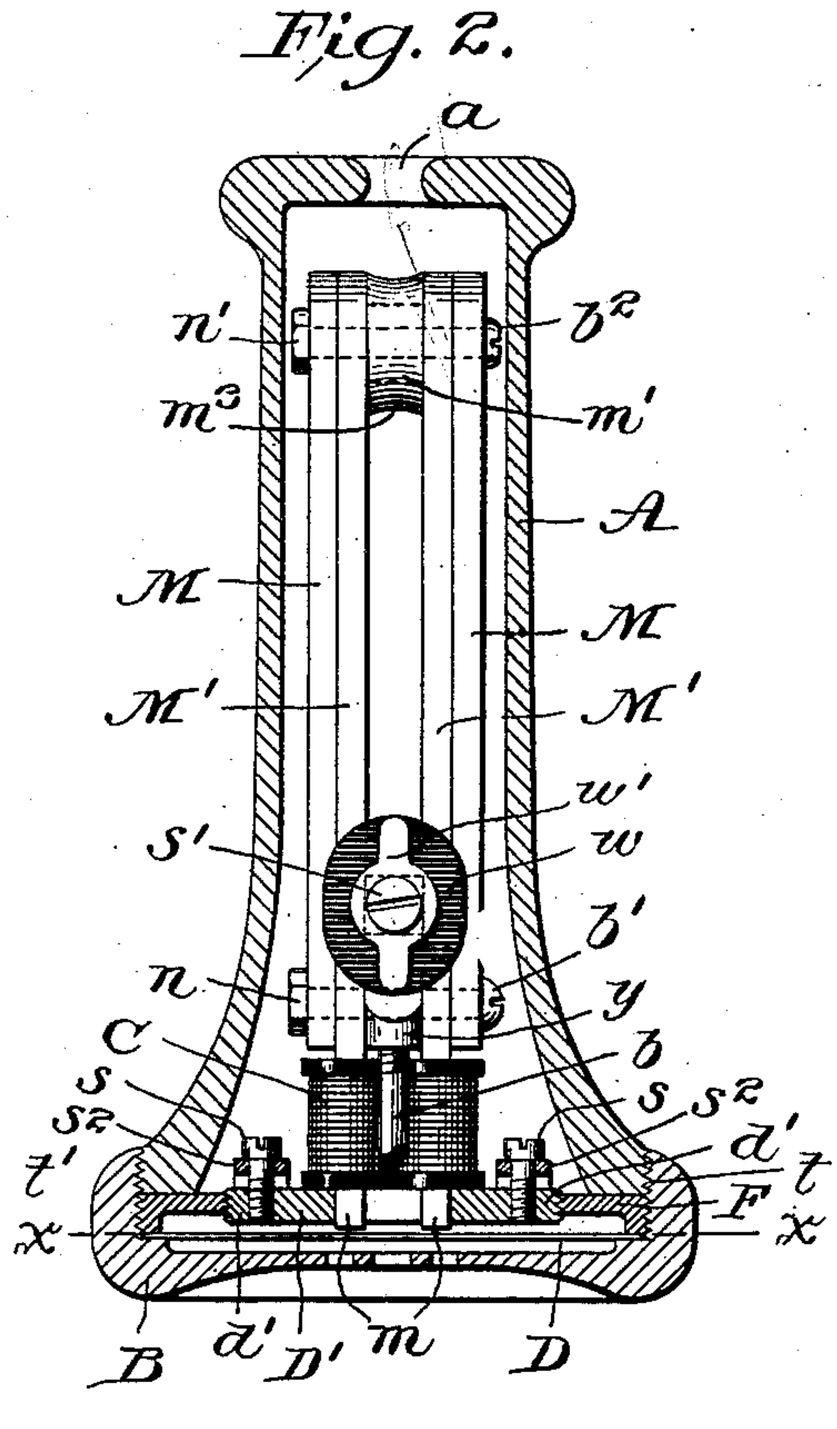


Fig. 3.

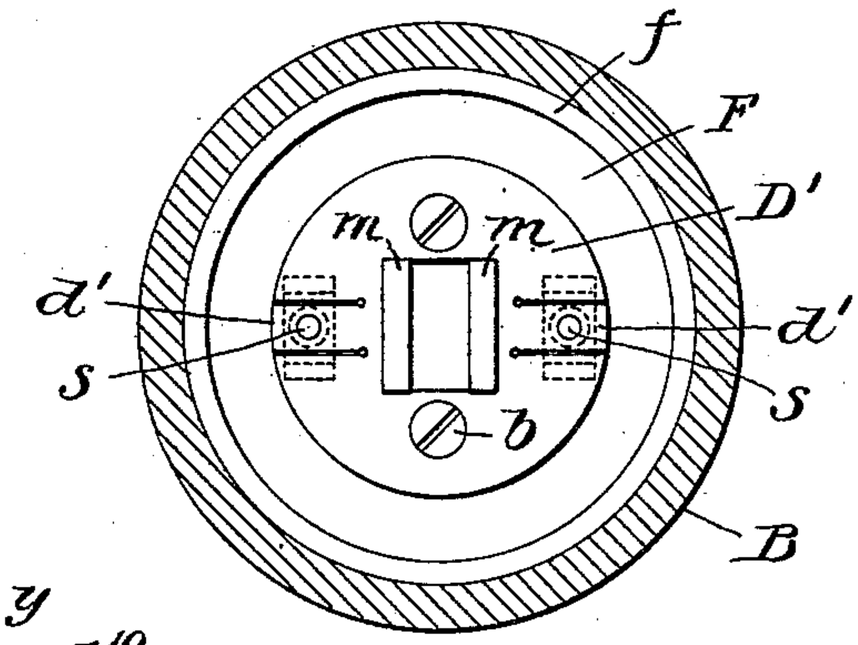


Fig. 4.

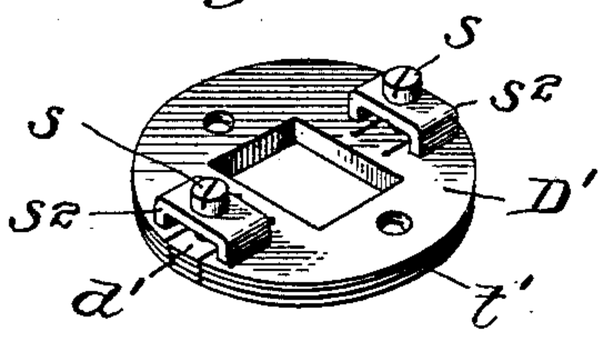
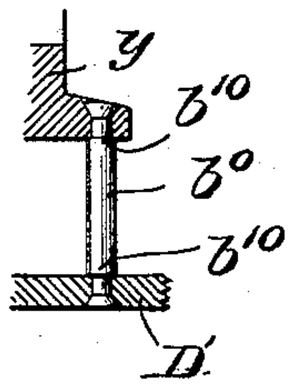


Fig. 5.



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WILLIAM D. GHARKY, OF PHILADELPHIA, PENNSYLVANIA.

TELEPHONE-RECEIVER.

SPECIFICATION forming part of Letters Patent No. 677,409, dated July 2, 1901.

Application filed September 4, 1900. Serial No. 28,861. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM D. GHARKY, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Telephone-Receiver, of which the following is a specification.

My invention relates to telephone-receivers, and has for its principal object the production of an instrument which is more efficient than those which have preceded it and which may be easily and quickly adjusted and rigidly secured in the adjusted position.

A further object is to so attach the connecting-cord that when the receiver is suspended thereby the electrical connections will be relieved of all strain.

I have various other objects in view, which will fully appear hereinafter.

In attaining these objects I mount the entire magnet structure of a telephone-receiver upon a support located between the magnet-windings and the diaphragm and provide means for adjusting and retaining the same at the proper distance from the diaphragm, together with means for attaching the connecting-cord to the permanent-magnet structure independent of the shell.

My invention is illustrated in the accompanying drawings, in which like letters of reference indicate the same parts.

Referring to the drawings, Figure 1 is a front part sectional view through the center of the receiver longitudinally. Fig. 2 is a similar side view of the same. Fig. 3 is a sectional plan view taken on the line x x of Fig. 2, viewed from below. Fig. 4 is a perspective view of the magnet-supporting disk and its locking device. Fig. 5 shows in detail a modification of the means for mounting the magnets upon the disk.

In my receiver the entire magnet structure is built upon and carried by a disk which is located between the magnet-windings and the diaphragm and is made up of two members—an inner disk D′ and an outer flange F. The edge of the flange F is formed over into a projecting rim and provided with a screw-thread adapted to engage the internal thread of the earpiece B and when screwed down holds the diaphragm D securely but free to vibrate. The inner edge of the flange is threaded to engage the externally-threaded disk D′, which is apertured to admit the pole-pieces m to close proximity to the diaphragm. Both the disk and flange may be made of brass or other non-magnetic metallic punchings, thus making this a very economical as well as efficient construction.

The permanent magnet is composed of two pairs of steel bar-magnets M M′ M M′, with like poles of each pair together in the usual manner and yoked by means of a bolt b^2, secured by nut n' and soft-iron block m'. This block m' is cylindrical and provided with a circumferential groove, over which the fiber ring m^3 is fitted loosely to allow of its rotation upon the block. The other ends of the bar-magnets are secured by a screw-bolt b', which passes through the outer bars M M, the soft-iron pole-pieces m m and a yoke Y, of brass or other non-magnetic metal, holding them firmly together. The pole-pieces are shouldered, as at m^2, to allow a sufficient length at the ends to project through the disk D′ and to take the strain of the screw-bolts b, which secure the said disk and yoke Y in rigid connection, leaving sufficient space between them for the magnet-coils C. The magnets and their accessories are thus firmly mounted upon the disk, which latter, together with the ends of the pole-pieces, is in close proximity to the diaphragm.

Instead of employing screw-bolts as a means of securing the yoke Y to the disk D′, I may and preferably do use rivets with shanks b^0 of sufficient length, one of which is shown in Fig. 5. The shank is shouldered where it enters the yoke and disk, as at b^{10}, to hold them at the proper distance apart, thus avoiding the necessity of shouldering the pole-pieces for that purpose.

To adjust the instrument, the flange T is screwed down into the earpiece and holds the diaphragm in place. The disk D, carrying the magnet structure, is then screwed into the flange, the small screws s being loosened, until the ends of the pole-pieces are the proper distance from the diaphragm. In order to secure the disk D′ in its position after the adjustment has been accomplished, I provide a locking device comprising tongues d' at op-

posite sides of the disk, each formed by two slits extending from the circumference toward the pole-pieces. These tongues are bridged by U-shaped metal pieces s^2 and are each tapped to receive a screw *s*, which passes through the bridge. When these screws *s* are tightened, the tongues are drawn slightly out of the plane of the disk, thereby frictionally locking the screw-threads on said tongues with the threads of the flange F and preventing any further relative rotary motion.

Tailed washers *w'* are mounted upon insulating-washers *w* upon the opposite sides of the magnets just above the yoke Y by means of screws *s'*, which enter a block of insulating material *i* between the bars. These washers *w*, besides insulating the connecting-washers *w'*, add very materially to the strength of the magnet structure by securing in place the free ends of the inner bar-magnets M'.

The circuit-wires from the receiver-cord after entering the hole *a* in the head of the shell A are knotted or otherwise secured around the insulating-ring m^3 of the spool *m'* and the ends carried to the tailed washers and soldered thereto. This ring m^3 serves to thoroughly insulate the wires from the yoke-spool and fitting loosely thereto is free to rotate, so that the wear caused by the movement of the cord will be between the ring and spool, thereby preventing chafing of the wire insulation. The terminals of the magnet-windings are then soldered to the other ends of said washers. When the final adjustments are made, the shell A is screwed into the earpiece B and forms a nut-lock for securing the flange F immovably in place.

The advantages of a receiver constructed according to my invention are obvious. The removal of the shell gives access to all the working parts which require attention. The support for the magnet structure is close to the diaphragm, so that the adjustment is not affected by the expansion or contraction of a considerable length of shell or metal between the support and the diaphragm, and the adjustment is readily made and quickly and rigidly secured.

I do not wish to be understood as limiting myself to the particular form of adjustment-locking device, as other means for accomplishing this may obviously be employed with good results without departing from the spirit of my invention.

Having described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a telephone-receiver, a magnet structure having a pole-piece and polar winding, a diaphragm secured in the field of the pole-piece, a disk adjustably located between the diaphragm and the polar winding and carrying the entire magnet structure, and an inclosing shell and cap, substantially as described.

2. In a telephone-receiver, the combination with an earpiece and a diaphragm, of a disk adjustably mounted in close proximity to said diaphragm, a magnet structure mounted upon and carried in its entirety by said disk, and a shell adapted to inclose the parts and engage the earpiece, substantially as described.

3. In a telephone-receiver, a diaphragm, a magnet structure comprising a permanent magnet together with a pole-piece and its windings, means adjustably located between the diaphragm and winding for securing said diaphragm and supporting the entire magnet structure, and an inclosing shell, substantially as described.

4. In a telephone-receiver, a diaphragm, a magnet structure, a disk carrying said structure in its entirety and rigidly secured thereto between the magnet-windings and the diaphragm, and means for adjusting and securing said disk with relation to the diaphragm, together with an inclosing shell, substantially as described.

5. In a telephone-receiver, the combination with an earpiece and a diaphragm, of a disk in close proximity to said diaphragm and adapted to secure it within the earpiece, a magnet structure mounted upon and carried in its entirety by said disk, the pole-pieces of said magnet structure projecting through said disk and having shoulders to rest thereagainst, and a shell adapted to inclose the parts and engage the earpiece, substantially as described.

6. In a telephone-receiver, an earpiece, a diaphragm, a ring carrying said diaphragm and secured to the earpiece, a disk adjustably attached to said ring, a magnet structure including a pole-piece and its winding mounted upon said disk, means for maintaining said disk and ring in rigid adjustment, and a shell inclosing said magnet structure and secured to the earpiece, substantially as described.

7. In a telephone-receiver, an earpiece, a diaphragm, an annular flange threaded peripherally to engage the earpiece, and holding the diaphragm, a disk threaded to engage said flange, a magnet structure mounted upon said disk, the pole-pieces projecting through said disk and the magnet-windings being on the opposite side thereof from the diaphragm, means for locking said flange and disk in fixed relative position, and an inclosing shell engaging the earpiece and securing said flange therein against rotation, substantially as described.

8. In a telephone-receiver, a diaphragm, a permanent magnet and its accessories, means located between said diaphragm and the magnet-winding for supporting the magnet structure, a spool at the head of the permanent magnet and a connecting-cord secured thereto, together with electrical connections and a containing-shell, substantially as described.

9. In a telephone-receiver, a magnet structure, a diaphragm, a spool located near the end of the magnet structure farthest from the diaphragm and between the magnet-

limbs, and a connecting-cord mechanically secured to said spool, together with electrical connections and a containing-shell, substantially as described.

10. In a telephone-receiver, a magnet structure carrying windings, a diaphragm, a distance piece or block near the end of the magnet structure opposite said diaphragm, a ring loosely fitting said distance-piece, and a connecting-cord electrically connected to the windings and mechanically secured to said ring, substantially as described.

In testimony whereof I have hereunto signed my name to the above specification in the presence of two subscribing witnesses.

WM. D. GHARKY.

Witnesses:
MORTON Z. PAUL,
EDWARD E. CLEMENT.